Inside This Issue of JACC

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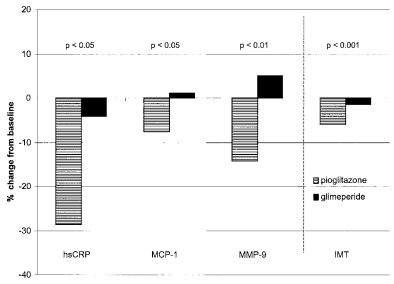

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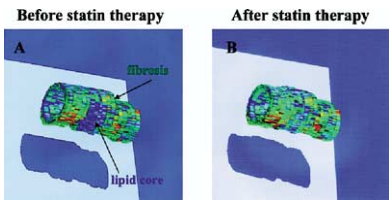
Clinical Trial

Pioglitazone Improves Cardiovascular Risk Factors

Thiazolidinediones may have benefits for diabetics in addition to lowering glucose levels via the peroxisome proliferator-activated receptor-gamma which is involved in inflammatory pathways. Pfützner and colleagues randomized subjects to either pioglitazone or the sulfonylurea glimeperide. With comparable glucose control, pioglitazone significantly reduced carotid intima-media thickness, raised high-density lipoprotein, and lowered high sensitive C-reactive protein compared to glimeperide, suggesting improved cardiovascular risk independent of glucose control. **See page 1925. See figure.**



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Intravascular Imaging and Vulnerable Plaque

Emerging Techniques to Identify Vulnerable Plaque

Four papers in this issue address techniques to identify vulnerable atherosclerotic plaques, those that are at increased risk for rupture. Kawasaki and colleagues used intravascular ultrasound (IVUS) to create three-dimensional maps based on the intensity of the integrated backscatter, which they previously found to correlate with histologic morphology. Murashige and colleagues describe a novel way of processing the IVUS signal, using a mathematical transformation known as wavelet analysis, and validate their model using ex vivo specimens. Schneiderman and colleagues report that a percutaneously insertable magnetic resonance imaging catheter is capable of characterizing the lipid content of arterial walls to a depth of 250 μm. Narula and colleagues describe the morphologic characteristics of vulnerable plaques, the clinical implications of these lesions, and emerging imaging modalities. They complemented these results with follow-up imaging after short-term statin treatment and demonstrated a reduced lipid content and increased fibrous content in these lesions. **See pages 1946, 1954, 1961, and 1970. See figure.**

Heart Failure

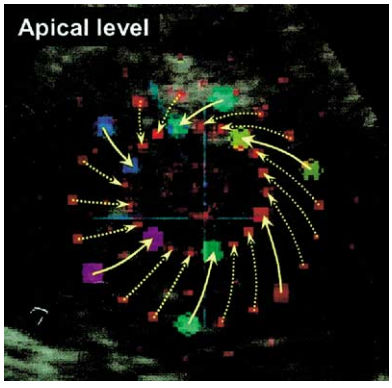
Hypertonic Saline Facilitates Diuresis in Diuretic Refractory CHF

Subjects with late stage cardiomyopathy may retain fluid despite high doses of diuretics and other standard treatments. Decreased renal perfusion is the presumed instigating event. The standard treatment, in addition to vasodilation and possibly inotropic therapy, is higher doses of diuretics and limiting sodium intake. Paterna and colleagues randomized subjects to either standard therapy, or standard therapy plus infusions of hypertonic saline, using a sliding scale based on serum sodium. Subjects who received hypertonic saline had improved diuresis, natruresis, and renal function. They were also discharged earlier, had fewer rehospitalizations, and lower brain natriuretic peptide suggesting that limiting sodium intake may be counterproductive. **See page 1997.**

Heart Rhythm Disorders

Echocardiographic Predictors of Atrial Fibrillation Recurrence

Olshansky and colleagues collected demographic and echocardiographic information from subjects enrolled in the AFFIRM (Atrial Fibrillation Follow-up Investigation of Rhythm Management) trial and attempted to identify echocardiographic parameters that would predict the subsequent recurrence of atrial fibrillation (AF) and/or stroke. A left atrial diameter >4.5 cm was associated with increased likelihood of AF recurrence, but neither the severity of mitral regurgitation nor reduced left ventricular function were associated with AF recurrence. None of the echocardiographic parameters were predictive of subsequent stroke. **See page 2026.**



Page 2035

Cardiac Imaging

New Echocardiographic Technique to Measure LV Rotational Movements

The systolic movements of the left ventricle (LV) are complex with wall thickening, length shortening, and rotational movements all combining to determine LV ejection. Quantifying the rotational movements is difficult with standard techniques, yet this torsional deformation and relaxation is thought to be a sensitive indicator of cardiac performance. Speckling on B-mode ultrasound is caused by back-scattering from structures smaller than a wavelength of sound. Notomi and colleagues describe an algorithm that can track the torsional movements of these speckle patterns and thus to calculate angular displacement and velocity. Comparison with magnetic resonance imaging data shows good correlation with this technique. **See page 2034. See figure.**